

Ally R.R.

AMERICAN RAILROAD JOURNAL

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, FINANCE,
INSURANCE, BANKING, MINING, MANUFACTURES.

HENRY V. POOR, *Editor.*

SATURDAY, JUNE 11, 1859.

Second Quarto Series, Vol. XV., No. 24.---Whole No. 1,208, Vol. XXXII.

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NEW-YORK:
PUBLISHED WEEKLY, BY
JOHN H. SCHULTZ & CO.
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No. 9 Spruce Street.

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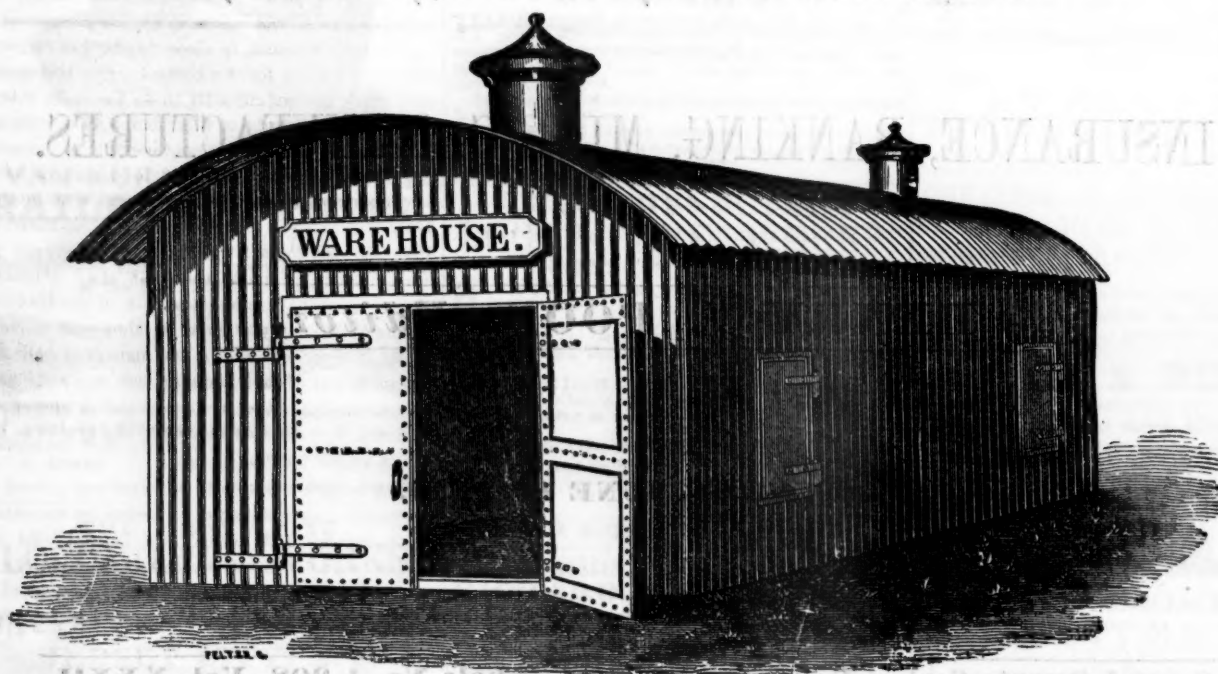
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SECOND QUARTO SERIES, VOL. XV., No. 24.]

SATURDAY, JUNE 11, 1859.

[WHOLE No. 1,208, VOL. XXXII.]

Messrs. ALGAR & STREET, No. 11 Clements Lane, Lombard Street, LONDON, are the authorised European Agents for the Journal.

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO. NO. 9 SPRUCE ST.

New York, Saturday, June 11, 1859.

Railroad Management.

To the Editor of the AM. RAILROAD JOURNAL.

I address this note to you for the purpose of eliciting your views upon a subject which I think of vast moment to the railroad interests of the country; and of the greater moment, because I believe that, from the aspect in which the matter seems to be viewed by many railroad directors, a most serious injury has grown up, and is exerting a deleterious influence upon this species of property. The question which I desire to have answered is this:—What are the absolute and relative powers, duties and obligations of the president of a railroad company and of the board of directors, to one another, in respect to the control, management and general administration of the affairs of a railroad corporation.

Upon a first view it would probably be answered that these are conferred, limited and depend solely upon the charters of these corporations. This doubtless would be the case where the charters are full and explicit upon this subject. But this, unfortunately, is the case with but few of them; and, consequently, these problems are left

to be solved by the circumstances attendant upon each individual case, to the prejudice of the true interest of the stockholders, and, frequently, to the loss of their property. Observation, and some experience, has brought me to the conclusion that the concentration of administrative responsibility upon the president of a railroad, and the usurpation of powers, which ought properly to belong to him, by the board of directors, is largely affecting this great interest. Most charters design that these things shall be provided for by by-laws, but in few instances is the making of by-laws attended to by stockholders, and the result is that these questions are left open as bones of contention between the executive of the road, and the directors. It will be a lucky day for railroad shareholders when the time arrives that something of military discipline shall be applied to the administration of roads. The interests of shareholders and the public at large are too great, nay vital, to place the administrative conduct of a railroad in the hands of a president, to be enervated by the indirect and *grave* responsibility of a board of directors. The true function of a board, as I conceive, is as an *advisory* council, to recommend by their counsels and reflect upon him, by their discussions, the general policy to be pursued in administering the affairs of the corporation they have in charge. To the president belongs the responsibility, and to him should be left the duty and honor of directing and giving energy to the execution of a wide discretion.

Excuse this cursory glance at the subject upon which I desire and request your views. I am a constant reader of your valuable paper, and for the reason that I set some store by your opinions and judgments upon all questions pertaining to railroad economy I now ask them.

Very respectfully,

A SUBSCRIBER.

New York, June 1, 1859.

If "A Subscriber" would allow us to supply the material and organize a board of directors, there would be an easy answer to his question. No road is well managed that is not guided by the intelligence, and directed by the will of *one* person. He should be allowed a wide range, though subject to

some rule of conduct, or some standard of responsibility laid down for his control. Our best managed roads are undoubtedly those the least interfered with by boards of directors. As a general rule, such a body are not near enough to the subject upon which they presume to decide, or have not given it sufficient attention to act with intelligence and safety. But however wise, no board of directors can impart intelligence and energy to the president, no more than can the convictions of one individual become the rule of conduct for another. No body of men, be they ever so competent in their own affairs, can manage a railroad so well as *one* of their number; nor was a railroad ever successful, either in construction or operation, that did not owe this success to the genius or capacity of *one* person.

How is such a person to be found and placed at the head of our companies? Before he can safely be entrusted with power, his capacity for its proper exercise must be shown. But not one in ten of the presidents of our roads are expected to have, in the outset at least, any experience in the duties which are to devolve upon them. Their financial influence gives them their positions. In other respects they may be politicians, adventurers, merchants, speculators, etc., etc. They do not propose, nor are they expected to qualify themselves for the task of managing a road. They may not be competent to superintend the construction of the simplest work on its line. They may not know one part of a locomotive from another. They may not be able to tell whether they are well or badly served by a single person under them. From this ignorance, their subordinates, no matter what may be their qualifications or degree of faithfulness, enjoy entire immunity in their positions—just as the managers of roads enjoy entire immunity in theirs, from a corresponding ignorance on the part of the stock and bondholders, of the responsibilities that should be exacted from them.

Under such circumstances, when matters go wrong, as they always will, it is natural that the directors should try their hand at the business: that each one should propose some nostrum, or panacea of his own—the sovereign remedy for the existing ills. They feel themselves authorized

to protrude their opinions from a consciousness that they are as wise as their chief. He defers to them for the same reason. The consequence is, that little is done, and that little is so diluted in its purpose and efficiency, that it might about as well be left undone. The road drags along, pays nothing to its stockholders, nor perhaps to its bondholders, and ends by becoming bankrupt—the reason of all of which the public are never able to comprehend.

The fallacy of "A Subscriber" consists in assuming presidents of railroads to be in all respects competent for their places, which is begging the whole question—admit it, and there is no room for argument.

Can such men be obtained? Not without an entire change in our present system, or want of system. This offers no rewards for good conduct, or to employees to qualify themselves for responsible positions, that bring both honor and emolument. A great many of our roads, and very important ones too, are constantly changing their officers. Those temporarily in power, with a conceit of knowledge very much in ratio to their ignorance, make a sweep of all below them and bring in a set as ignorant and conceited as themselves. The great body of superintendents are *peripatetics*, wandering round from one road to another, without being allowed to remain in one place a sufficient time to get fairly warm in it, or to establish anything like a permanent system or policy, or to display the qualities they may really possess. Should one not prove acceptable to the president or directors who may be entirely unfit to form any opinion of his qualifications, he must go. This is one of the worst features about our roads. No sufficient encouragement is offered to young men to enter the service of companies, in the expectation that qualifications will regularly lead to preferment—thus offering the highest positions as the rewards of merit. As it is, merit and position have no necessary connection. They are much oftener disjointed than united. The result is that the success of a railroad is all a matter of *chance*. It creates no surprise to find one which was supposed to be *all right to-day, all wrong to-morrow*. The public chronicle the result with a sort of stoical indifference. But where the fault lies defies all inquiry or analysis.

The primary fault is undoubtedly to be looked for in the ignorance that prevails in the public mind upon the subject of railroad management. This ignorance is in part due to the silence that railroad managers usually maintain as to the manner in which they or their subordinates have discharged their duties. We have not to go far in proof of this remark. We should like to find the man who can tell us how the Hudson River, the New York and New Haven, the Erie, the Camden and Amboy, or even the New York Central is managed? Certainly no idea is to be got from anything the managers of these roads have ever told us. Their policy is to say just as little as the law will allow them to. The only standard the public have whereby to form an opinion is the apparent degree of success obtained. But this even may not be one-half what it should be.

The great thing wanted is, that every person who occupies an important position on a road should be compelled to make a public exhibition

of himself once or twice a year at least. An appropriate place for this exhibition is in the stated reports of the companies. We think as a general rule, that our roads are well managed just in proportion to the thoroughness with which this exhibition is made. We will cite the Baltimore and Ohio and Pennsylvania railroads in proof. In these, the parties holding important subordinate positions, are made to tell their own story. They naturally desire to make a creditable display of themselves, and to enable themselves to do so, for a series of years, their conduct must approach the standard of excellence they wish to assume. A desire for a good name becomes necessarily a matter of habit which ends in deserving one. An army would not be worth a straw, when nothing was ever heard of any one but the commander in chief. In most of our railroad companies, no figure is seen but that of the chief executive. All below him are an undistinguished mass, without anything like individual life, and without the motive to any. Where no adequate motive exists, no great excellence will ever be found.

We have already made a long story, but we will say a word or two more. Behind the indifference in the part of the managers is, as already stated, that of the owners of our roads. Among these there is very little interest felt as to the manner in which they are conducted. It is natural that it should be so. Almost every person in the United States is deeply immersed in his own business or calling, the duties of which tax all his capacities. We all know that nothing is so annoying and wearisome to a person so engrossed as to have his attention called to matters entirely foreign to his ordinary pursuits. It is like entering upon a business with which one has not the slightest experience, or the organizing a new department in his mental operations, already too much taxed—or assuming labors and duties for which he never had the least aptitude. Now a sense of duty or interest may, in the outset, lead a person, who has invested largely in a railroad, to pay some attention to the manner in which it is managed. But habit and inclination are stronger than the momentary impulse which a new investment communicates. If the road, luckily, be well managed, he gladly throws off all care or thought about it. If badly, the keen sense of loss gradually becomes weakened by lapse of time, and by his having made it up in his own regular business. He sees his folly in having ever departed from it, charges all his investment to *profit and loss*, preferring to sink the whole rather than to have his mind distracted by dwelling upon, or looking after his unlucky venture. Henceforth the managers of the road, having no check from its owners, go on their own way, without let or hindrance.

There is a remedy for all these evils, which is to make our roads, in effect, *private property*. The great curse of the United States is *joint stock corporations*. In these, it is the interest and aim with every person employed, to get the largest sum possible for the smallest amount of service rendered. This statement measures the relations of a corporation and the servants of it. In such as are successful, the pay is graduated upon the scale of exact equivalents—so much service, or labor, for so much pay—as in an iron mill or a cotton factory. Were these to hire their workmen as do railroads, they could not stand a year. To

make railroads successful we must introduce a similar principle—that of individual responsibility. Make compensation depend upon services rendered, and every person employed will do his best, as the means of increasing the amount of his compensation. If the running of our railroads, or if the different departments of service could be farmed out, it would not be long before they would be in the hands of those persons best competent to make the largest sum possible out of them. Such men directly appealed to, would not long be lacking in any branch of service. Every road, capable of being so, would be rendered productive. Success is the general rule of society. In every great interest there should be steady improvement. Railroads would fall under a similar law, in which intelligence and capacity would have full and free scope, and where every person employed, no matter how insignificant his position, would become a co-laborer to a common end.

The War and the North American Overland Route.

(From the *London Post*, May 17.)

Among the grave consequences that may result from the existing state of things on the Continent is one of especial interest to England, alike in a commercial and in a political point of view—the interruption, namely, of our overland communication with the East. Should it happen, by whatever deplorable complication, that we became belligerent, and that France and Russia were among our opponents, there can be no doubt that a chief object with these Powers, for various considerations, would be to close against us that road to India which we now travel with such comparative speed and facility through Egypt, and to preclude us from that other highway which Sir Macdonald Stephenson is so energetically essaying to open up to us through Turkey. Were these objects accomplished—and where the stake is so important it is better to contemplate, in order that we may provide against the worst—the effect of our *exclusion from prompt inter-communication with the East through Egypt, or through Turkey, might be disastrous as well to our commercial as to our political interests*, were no timely means taken to neutralize the evil, by securing a communication in another direction. It is very true that the bulkier classes of our merchandise might continue, as now, to be sent round the Cape, and that the employment of a line of steam transport ships on that route, as proposed by Messrs. Croskey, might materially facilitate the transit, as well of heavy merchandise as of troops, under ordinary circumstances; for, as it is, the forwarding of goods by the Egyptian overland route is only suited for comparatively light articles. The vital object, however, is to secure railway communication to the utmost possible extent between this country and our possessions, and our markets in the East, or, the route thither changed, the far West as it would become to us, and to have that railway communication wholly on our own ground, secure alike from the assaults of enemies, and from the gross extortions of such friends as the Pasha of Egypt, who mulcts the customers of the Peninsular and Oriental Steam Packet Company in the sum of £8 per ton for conveyance between Alexandria and Suez, thus bringing up the total expenses from England to Bombay, Madras, or Calcutta, to the high figure of £36 per ton of forty cubic feet, besides a per centage put on for value.

Under these circumstances it is especially gratifying to reflect that we have the means of completing a through transit from England to India and the East, so far as railways are concerned, *entirely within our own possessions*. The great question of the Inter-oceanic Railway that, despite all difficulties, is to connect the Atlantic with the Pacific, between Halifax and Vancouver's island, has more than once been emphatically urged upon public

attention in these columns. One great difficulty, by many persons deemed insuperable, seemed to present itself in the vast range known as the Rocky Mountains, whose frowning precipices were supposed by the large class who take things for granted to form an impassable barrier between the prairies of the Saskatchewan and the new colony of British Columbia, that new Liverpool, which we confidently expect to see rising up within a few years on Vancouver's Island. Happily, however, as the result of the scientific exploration of the route, which has been made by Captain Palliser and Dr. Heeler, all question of obstruction in the passage of the Rocky Mountains is completely set at rest, and there is clearly shown to be no practical difficulty in the way of the speedy construction of a railway to the Pacific through British North America. The highly influential gentlemen who form the direction of the North-west Transportation Company, and who as such, have undertaken to open up a route between, in the first instance, Lake Superior and the Red river settlement, seem to consider that some years must necessarily elapse before a direct railway communication can, under the most favorable circumstances, be established; but we trust that maturer observation of the subject will render them more confident as to the feasibility of effecting railway communication itself. The Americans are more go-ahead folks than we in their speculations, no doubt; but it has yet to be shown that we are not as energetic and effective as they when a practical object of clear utility is set before us. In no respect have the people of the United States manifested greater development than in the extension of railway inter-communication. Of this power, Mr. Oliphant, in his amusing work on "Minnesota and the Far West," gives an emphatic illustration in the case of the railway traffic of Chicago. In 1852, he tells us, there was only one railway, forty miles long, into that city; but when he re-visited the place in 1855, nearly twenty railroads radiated; either directly, or by connection, from Chicago, with an aggregate length of two thousand five hundred miles—"each from one to three hundred miles long, passing through and opening up new and fertile districts." Now, the distance between Fraser river, in British Columbia, and the western head of Lake Superior, is only fifteen hundred miles; and although there certainly do not exist on the route those already created towns which in the States served as feeders for the various railways, there do exist throughout the line the "new and fertile district" which, access to them, once furnished, will give birth to towns that will amply feed the railway of themselves, to say nothing of Canadian nutriment; while there exist, moreover, on this side, the greatest powers of supply of all manufactured goods known in the world, and, on the other side, six hundred millions of people ready, now or proximately, to be customers for those goods. Along this line the commodities of the East and those of the West will be interchanged with a rapidity now impracticable, for the distance between, say Canton and London, will be lessened by not fewer than five thousand three hundred and fifty miles, of which, moreover, a considerable proportion will be represented by railway transit. The object is one of such importance in every point of view that we trust the government at home will lend their hearty and liberal support to its promotion, in whatever way may be found most expedient, and this support should find zealous co-operation on the part of the provisional governments. There seems some difficulty impeding the development of the line between Halifax and Quebec, which would have formed the first portion of the great Inter-oceanic Railway. Wherever this difficulty lies, it is earnestly to be desired that no effort be omitted to remove it, and at once.

We are glad to see the attention of Englishmen turned toward their possessions in this country. Whatever may be said of the practicability of carrying on a large commerce, by railway, across this continent, the discussion of such a scheme will tend to draw attention to, and develop the re-

sources of the interior of British America, about which little is now known, although in a few years it is destined to attract great interest, not only in Europe but in the United States. The construction of a line of railroad from St. Paul to the navigable waters of the Red River of the North would open several hundred thousands of square miles of country, possessing an excellent soil, a good climate, and extraordinary commercial facilities. The colonies that England has planted upon unoccupied soils have proved much more profitable to her commerce, and have given much less trouble in their political relations than the subjugated races which are held by no tie but that of force. The best customer of Great Britain is the United States—the next best, her North American Colonies. The most important of these, the Canadas, occupy an area insignificant in extent and value, compared with that lying upon the Saskatchewan and the Red River of the North. Only let this new territory be opened, and the wonderful progress of the United States and Canada will be repeated in a new field.

In reference to this country, Englishmen make a common and almost necessary mistake, considering their exclusive and unaffiliating character. They turn their attention hitherward for fear that they may be compelled to share their present route with Russians or French. On this continent they show a similar repugnance to coming into contact with the United States. We must have, say they, a route across the continent entirely within our own territory. This, for commercial purposes, is simply a matter of impossibility. No continuous route for a railroad from ocean to ocean can be found in British territory. A railroad cannot be constructed at any reasonable cost around the north shore of Lake Superior. Were it possible, nothing would pass over it from its inaccessibility and immense cost. Commerce knows no political line. A merchant who had anything to send across the continent, would not stop to ask about the political institutions of the region traversed, but about the cheapest, safest and most expeditious route. A war between the two countries would put an end to not only all commerce, but to the running of the road through the British Possessions. In peace, the cheapest carrier would take the business. The St. Lawrence is closed for six months in the year; Lake Superior for a still longer time. Through these waters must a railway through British territory be reached. A great commerce can never be subjected to such interference as this, when shorter and better routes exist, approachable every day in the year.

Notwithstanding the present feeling in England, we are glad to see that events taking place elsewhere are turning attention this way. Prejudice will soon give place to more correct views, and to a more enlightened policy. We do not despair, even, of seeing Englishmen assisting in the construction of a great work in the United States, which is to open to them their own territory—we mean the Minnesota and Pacific Railroad. The completion of this work would throw open the whole interior of the continent to the very base of the Rocky Mountains, and to the Pacific coast. Should these mountains prove to be easily penetrable, as is confidently affirmed, the first step to this end will not be taken till the construction of the work named.

Rock Island Bridge.

We gave not long since a copy of instructions issued by the Secretary of War to a commission of officers of the United States Topographical Corps, directing them to inquire in the obstructions to navigation, alleged to be caused by the bridge over the Mississippi at Rock Island. This committee have made an examination of the bridge, and have submitted a report, of which the following is an abstract:

1. The Board is of opinion that the railroad bridge, which crosses the Mississippi river between Rock Island and Davenport, is not constructed according to correct principles, reference being had to the interests of navigation.

2. The piers of said bridge are not of the best form, and there was no practical difficulty in constructing them of the proper form. With the exception of the turn-table pier, the Board is of opinion that the defective form is a matter of no national importance. The turn-table pier will be more particularly referred to in answer to the next question.

3. The only pier larger than is necessary is the turn-table pier. This pier, in the opinion of the Board, should have been constructed no longer or broader than was absolutely necessary to sustain the trap when the draw is open, and protect it from injury by passing boats. It might have been constructed with a length of 295 feet, affording ample support and protection, it being actually 355 feet in length, the difference, 60 feet, is unnecessary, and, in the judgment of the Board, pernicious. The effect of making it larger than was absolutely necessary, is to contract the water way, increase the velocity, narrow the draw passage and present more surface for boats to strike against; thus increasing the difficulty of their passage through the draw. In a pier of this size the form of the starling is of importance, and the upper faces of the pier should have been curved surfaces.

4. The piers are not placed parallel with the current, but at angles varying from 26 to 14½ degrees. The effect of this obliquity is to treble the obstruction to the flow of the water, and consequently to affect the increase of velocity in the same ratio. Another consequence is that the passage of steamboats and rafts through the draw and between the piers is rendered much more difficult and hazardous. Furthermore, the draw on the Iowa side is rendered useless by the formation therein of an eddy.

5. The velocities in the different parts of the river in the vicinity of the bridge have already been stated, and will be found tabulated in appendix.

6. The eddy on the Iowa side of the turn-table, as nearly as could be estimated, is about 100 feet wide at the top of the pier, and the turbulence and boiling of the water extends about 500 feet below. This eddy, however, is constantly varying its position and dimensions. Its effect on the passage of boats ascending and descending, is undoubtedly to render them more difficult on account of the care required to avoid getting one part of the boat into it, while another part is in the current of the draw. It has been previously stated that the effect of this eddy in the Iowa draw is to render it useless.

7. The surface of the water at the up-stream end of the turn-table pier, is sixteen and a-half inches above the surface of the water at the down stream end. The extent of the back water, or *remous*, as nearly as could be estimated, is about one hundred and fifty feet.

8. The bridge is badly located, and, in consequence of this bad location, is a greater obstruction to the passage of steamboats than would have been necessary had the location been good. Any site in the vicinity of Rock Island, out of the rapid current, would have been better.

The Board considers it proper to recapitulate some of the well known principles of bridge building, to show how far they have been conformed to or departed from with the Rock Island Bridge.

These principles are:

1. That at a given place, in locating a bridge over any stream, the site where the velocity of the current is minimum, should be selected.

2. That in designing a bridge, the piers should have the minimum cross section consistent with the support of the superstructure, thus offering the least obstruction to the flow of the water, and increasing the velocity of the current as little as possible.

3. The piers should always be placed parallel with the thread of the stream for the same reasons as those stated in the second principle, and because they thus render the passage of boats and rafts less difficult.

4. In designing a bridge over a river having a large commerce in boats and rafts, the draws and piers should be of the greatest practicable width.

In applying these principles to the Rock Island Bridge the Board is constrained with extreme regret to report that *all have been violated*, thus rendering the bridge not only an obstruction to the navigation of the river, but one materially greater than there was any occasion for.

The result of this report will be, we suppose, that the present bridge will have to come down. We presume there would be no objections to the construction of a new one, avoiding those which attach to the present one. The destruction of it would involve a heavy loss to the Rock Island Railroad which has a large interest in it.

LaGrange and Columbus Railroad.

The people of Eastern Georgia are agitating the construction of a railroad from LaGrange, on the line of the Atlanta and LaGrange Railroad to Columbus. In reference to this project, the Atlanta Republic says:

Already \$175,000 has been subscribed between LaGrange and Hamilton, and the amount in prospective, which will be subscribed, will put the subscriptions up to \$300,000—thereby making the road certain of success so far as the upper end is concerned. If the people of the southern part of Harris, and the northern part of Muscogee, will come up to the rescue, the success of the enterprise will be placed beyond a doubt; and we have every reason to believe that they will.

Mr. Edward Broughton, a gentleman of long experience in building railroads—and withal a man with the means, energy, and ability, to carry out any contract he undertakes—proposes, that if \$300,000 will be raised, he will commence the road and build it to Hamilton at fair prices; and what is lacking to remunerate him for such service he will take in stock.

If the road is built to Hamilton, the people below, and at Columbus, will never allow it to stop at that point. Self-protection would force them to carry it on to Columbus. Therefore, we may conclude that the road *will be built*.

TREATISE

ON THE

PRINCIPLES OF CIVIL ENGINEERING

AS APPLIED TO THE

CONSTRUCTION OF WOODEN BRIDGES.

By S. S. Post, Civil Engineer,

And late Chief Engineer of the N. Y. & Erie R. R.

(Continued from p. 359.)

EXAMPLE F.

Suppose a truss is required to be 20 feet high, in the middle, about 160 feet clear span, and to have the outline of the greater portion of a semi-ellipse.

Any length of ellipse may be assumed which, on trial, will give a suitable length of ordinate for the end height of the truss.

For simplicity in calculation the length of the ellipse in this case is taken at 200 feet.

[Fig. 70.]

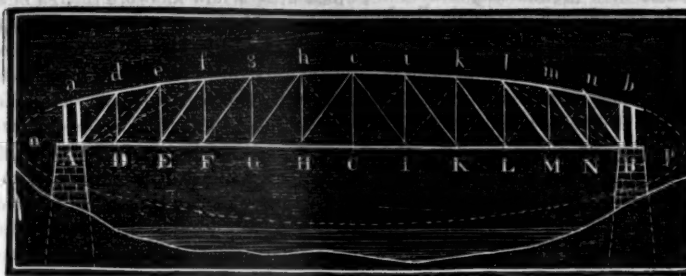


Fig. 70 represents a truss with a top conforming to the curvature of an ellipse, the longest diameter of which, is 200 feet, and the shortest diameter 40 feet.

Then the middle height (Cc) of the truss is 20 feet, and half the transverse axis (Co) of the ellipse is 100 feet.

Making the width of the first panel from the middle CI=CH=15 feet, the ratio of the height to the width will be—

$$20 : 15 ; \text{ or } 1 : 75 ; \text{ or } \frac{15}{20} = 0.75.$$

Putting $y = Hh$, x will be equal 15, and the equation $y^2 = b^2 - \frac{b^2 x^2}{a^2}$ becomes $(Hh)^2 =$

$$20^2 - \frac{20^2 \times 15^2}{100^2} = 400 - \frac{400 \times 225}{10,000} = 391 = (19.77)^2.$$

The height of the ordinate Hh is thus found to be 19.77 feet. Multiplying this height by the ratio 0.75 gives the width of the second panel (GH) $19.77 \times 0.75 = 14.83$, to which add the width of the first panel for a second value of $x = 14.83 + 15 = 29.83$. Then—

$$y^2 = (Gg)^2 = 400 - \frac{400 \times 29.83 \times 29.83}{10,000} = 364.41$$

$$FG = 19.09 \times 0.75 = 14.32, \text{ and } 14.32 + 29.83 = 44.15 = FC = x,$$

$$y^2 = (Ff)^2 = 400 - \frac{400 \times 44.15 \times 44.15}{10,000} = 322.03$$

$$EF = 17.95 \times 0.75 = 13.46, \text{ and } 13.46 + 44.15 = 57.61 = EC = x,$$

$$y^2 = (Ee)^2 = 400 - \frac{400 \times 57.61 \times 57.61}{10,000} = 267.24$$

$$DE = 16.35 \times 0.75 = 12.26, \text{ and } 12.26 + 57.61 = 69.87 = DC = x,$$

$$y^2 = (Dd)^2 = 400 - \frac{400 \times 69.87 \times 69.87}{10,000} = 204.73$$

$$AD = 14.31 \times 0.75 = 10.73, \text{ and } 10.73 + 69.87 = 80.60 = AC = x,$$

$$y^2 = (Aa)^2 = 400 - \frac{400 \times 80.60 \times 80.60}{10,000} = 140.15$$

$$= (11.84)^2.$$

The widths of the panels of each half span are 15, 14, 83, 14.32, 13.46, 12.26 and 10.73 = 80.6 feet. The whole span exceeds that proposed by 1.2 feet. This may be corrected by a proportionate reduction of the ratio of the height and width of the first panel, and repeating the operation.

Should it be desirable, the span may be extended in a similar manner by adding two, four, or more panels.

Taking the clear span at 161.2 feet and assuming that every foot of the truss is loaded with 1,500 lbs.; the total weight between the bearing points on the abutments (A and B) will be 241,800

lbs., or upon a half span 120,900 lbs. Of this weight the vertical ties will each sustain, directly, so much as belongs to the contiguous half panels. The weight due to the panel CH will be supported one-half by the tie Cc and the other half by the tie Hh. The tie Hh will also support one-half of the weight due to the panel GH, while the other half will be supported by the tie Gg, etc., etc.

The weight upon each tie, of one-half the span, will be—

$$\text{On Cc } \frac{15}{2} \times 1,500 = 11,250 \text{ lbs.}$$

$$\text{“ Hh } \left(\frac{15}{2} + \frac{14.83}{2} \right) \times 1,500 = 22,373 \text{ “}$$

$$\text{“ Gg } \left(\frac{14.83}{2} + \frac{14.32}{2} \right) \times 1,500 = 21,862 \text{ “}$$

$$\text{“ Ff } \left(\frac{14.32}{2} + \frac{13.46}{2} \right) \times 1,500 = 20,835 \text{ “}$$

$$\text{“ Ee } \left(\frac{13.46}{2} + \frac{12.26}{2} \right) \times 1,500 = 19,290 \text{ “}$$

$$\text{“ Dd } \left(\frac{12.26}{2} + \frac{10.73}{2} \right) \times 1,500 = 17,242 \text{ “}$$

$$\text{“ Abutment A } \frac{10.73}{2} \times 1,500 = 8,048 \text{ “}$$

$$\text{Total half span} = 120,900 \text{ lbs.}$$

The vertical pressures upon the braces will be—

$$\text{On cH} 11,250 \text{ lbs.}$$

$$\text{“ hG } 11,250 + 22,373 = 33,623 \text{ “}$$

$$\text{“ gF } 33,623 + 21,862 = 55,485 \text{ “}$$

$$\text{“ fE } 55,485 + 20,835 = 76,320 \text{ “}$$

$$\text{“ eD } 76,320 + 19,290 = 95,610 \text{ “}$$

$$\text{“ dA } 95,610 + 17,242 = 112,852 \text{ “}$$

$$\text{On abutmt A } 112,852 + 8,048 = 120,900 \text{ “}$$

The ratio of the heights to the widths of the panels being as 1 to $\frac{3}{4}$, the horizontal thrusts of the braces will be three-fourths of the vertical forces.

Then the horizontal thrusts of the braces, and the consequent tension upon the bottom chord, will be

$$\text{Of brace cH } 8,437 \frac{1}{2} \text{ lbs. tension on CH,}$$

$$\text{“ “ hG } 25,217 \frac{1}{2} \text{ “ “ “ CG,}$$

$$\text{“ “ gF } 41,613 \frac{1}{2} \text{ “ “ “ CF,}$$

$$\text{“ “ fE } 57,240 \text{ “ “ “ CE,}$$

$$\text{“ “ eD } 71,707 \frac{1}{2} \text{ “ “ “ CD,}$$

$$\text{“ “ dA } 84,639 \text{ “ “ “ CA.}$$

$$\text{Total} 288,855 \text{ lbs. at middle of chord.}$$

The ratio of height to width being the same for all the panels, the ratio of the height to the diagonals, in the direction of the braces, will also be uniform for all the panels.

The length of the brace Hc is 25 feet—for $\sqrt{(20^2 + 15^2)} = 25$ —and the ratio of the vertical to the oblique is as 20 : 25, or as 1 : $\frac{5}{4}$; or, $\frac{25}{20} = 1.25$.

Consequently, the oblique strain, or thrust of each brace, is one-fourth greater than the vertical force applied to that brace.

The oblique strains of the braces are—

On brace cH	14,062½ lbs.
" " hG	42,028½ "
" " gF	69,356½ "
" " fE	95,400 "
" " eD	119,512½ "
" " dA	141,065 "

Of the 1,500 lbs. per lineal foot, 600 lbs. may be taken as weight of structure, and 900 lbs. weight of passing load. The vertical pressures upon the counter-braces will be to the vertical pressures on the direct braces, as 900 to 1,500, or as 3 to 5. If the braces and the counter-braces of each panel were of the same length, their oblique thrusts would be in the same ratio. In this case however the strain upon the counter-brace will somewhat exceed three-fifths of the strains upon the braces in the same panel.

The approximate strains, to which the various timbers, bolts, etc., will be subject, having been calculated, their dimensions may be determined as in the previous examples, good judgment and mechanical knowledge being requisite in fixing upon the most suitable loading proportions of sections of the chords, braces, beams, etc.

Having disposed of this truss as an independent open beam, it may be well to inquire farther into the effect of combining with the beam, the principle of the confined arch, composed of a system of arch-braces and straining beam, as illustrated in *Fig. 59* to *67* inclusive, and by means of which a latent strength is kept in store to provide against the contingency of a broken chord.

In the McCallum arrangement, as illustrated in *Fig. 59*, the end heights of the truss are sufficient to allow the smoke stack of a locomotive engine to pass under top lateral bracings, and the arch braces take such angles that the resultant of their oblique forces is inclined about 45 degrees or one to one. In this case the vertical and horizontal pressures are equal to each other.

Suppose arch-braces to be used in the present example, and inserted as from A to f and A to e, *Fig. 70*, bearing firmly upon the angle of the abutment, or pier A, so that they support the weight of one-half the truss and its load. Let the depth of the chord be 15 inches, the *corbel* or bolster 10 inches, and the wall plate 5 inches, in all 30 inches, or 2.5 feet, from the top of the chord to the angle formed by the face and the top surface of the abutment.

The arch-brace Af will then have an inclination of 20.45 vertical to 36.45 horizontal and its length will be $\sqrt{(20.45)^2 + (36.45)^2} = 41.8$ feet.

The arch-brace Ae will have an inclination of 18.85 vertical and 22.99 horizontal, and its length will be $\sqrt{(18.85)^2 + (22.99)^2} = 29.73$ feet.

The weight of the half truss and its load being 120,900 lbs., the vertical pressure on each arch-brace, if alike, will be 60,450 lbs.

The oblique thrust of the longer brace will be 20.45 : 41.8 :: 60,450 : 123,555 lbs.

The oblique thrust of the shorter brace will be 18.85 : 29.73 :: 60,450 : 95,841 lbs.

If these braces are supported laterally by the posts Dd and Ee, as in *Fig. 59*, their length will be divided into segments, the longest of which will be about 14 feet, and if their thickness be taken at 12 inches, they will resist the same tendency to compression, per square inch of section, as a pillar 14 diameters in length, or say 800 lbs.

The depth of the longer brace will be nearly 13

inches; for $13 \times 12 \times 800 = 124,800$ lbs.; and the depth of the shorter brace will be nearly 10 inches; for $10 \times 12 \times 800 = 96,000$ lbs.

The horizontal thrusts of these braces will be—

20.45 : 36.45 :: 60,450 : 107,745 lbs.
and 18.85 : 22.99 :: 60,450 : 73,726 "

Total horizontal thrust... 181,471 lbs.
Deduct half weight of truss... 120,900 "

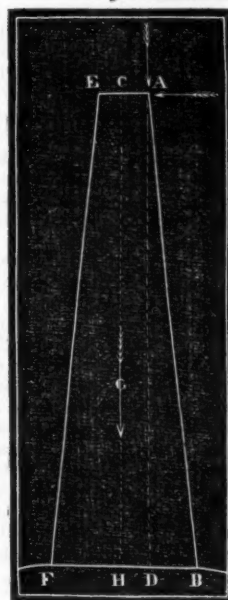
Excess of horizontal force... 60,571 lbs.

The resultant of oblique forces in this case has an inclination of 2 vertical to 3 horizontal very nearly.

The horizontal strain at the middle of the chord was found to be 288,855 lbs.
The horizontal thrust of arch-braces... 181,471 "

Difference in favor of arch (36 per ct.) 107,384 "

Fig. 71.



§ 100. The centre of gravity (G) of the pier (*Fig. 71*) is in the line CH and the weight of the mass acts vertically upon the point H at the middle of the base (BF).

Any horizontal force, applied at A, will have a tendency to overturn the pier, about the angle F and to raise the point H. Then CHF may be considered as a bent lever with its fulcrum at F; the weight to be moved at H and the power applied at C.

Again, if a weight be applied at A it will act vertically upon the point D, and the two arms of the lever will be AD and DF.

A pier of solid granite 5 feet wide and 25 feet long on the top, 50 feet deep with a *batir*, of 0.1, will contain 15,416½ cubic ft., weighing, at 170 lbs. per cubic foot, 2,620,833 lbs., and without any superincumbent weight, will require a horizontal force of 393,120 lbs. to overturn it. If one-half the weight of the bridge (241,800 lbs.) rest upon the angle A of the pier (*Fig. 71*) it will require an additional horizontal force of 48,360 lbs. to overturn it, or a total horizontal force of 441,480 lbs.

The horizontal thrust of the arch-braces, of the two opposite trusses of a single track bridge, is $181,471 \times 2 = 362,942$ lbs.

The horizontal thrust is, therefore, 78,540 lbs., or 20 per cent. less than the pier has the ability to resist.

The horizontal strain upon the chords of the two trusses, is $288,855 \times 2 = 577,710$ lbs., which strain, in case both chords were to be severed, would thrust horizontally at the tops of the piers, and this thrust would be 136,230 lbs. or 31 per cent. more than the pier can sustain.

In case the pier should happen to be founded upon the level surface of a solid rock, the base closely fitted and cemented with mortar having a tenacity of only 12 lbs. per square inch, it will resist a further horizontal force of 136,080 lbs. For, the base has an area of $35 \times 15 = 525$ square feet; and the total tenacity of the mortar at the base will be $525 \times 144 \times 12 = 907,200$ lbs.

This will resist a horizontal pressure, at C, of $907,200 \times 7\frac{1}{4} = 136,080$ lbs.

50

The sum of the horizontal forces which the pier can now resist will be on account of its own weight..... 393,120 lbs.
On acc't of weight of superstructure 48,360 "
On acc't of tenacity of mortar at base, 136,080 "

Total resistance of pier..... 577,560 "

Stability of pier less than tension on chord, 150 lbs.

Stability of pier greater than thrust of arch, 214,768 lbs.

(To be continued.)

Journal of Railroad Law.

TRANSPORTATION CONTRACTS—MEANING OF THE WORD "TOLL."

Some time since an agreement was entered into between the Delaware and Hudson Canal Company and the Pennsylvania Coal Company, providing for the transportation of the coal mined by the Pennsylvania Coal Company, over the Delaware and Hudson Canal. The agreement provided that the Coal Company should have the right to transport coal over the canal with the same facilities as were enjoyed by the Canal Company themselves, or by any other persons. It further provided specially for a rate of tolls to be established on the first of May in each year. These tolls were to be fixed by ascertaining the quantity of lump coal belonging to the company, which, at that period, they should have contracted to sell and to deliver at Rondout, (the easterly terminus of the canal,) by transportation on the canal, during the year. The average price per ton of these sales were to be ascertained. From this average price, \$2.50 per ton was to be deducted, and one-half the remainder was to be the toll per ton to be charged to the Pennsylvania Coal Company for the transportation of their coal during the year.

The agreement further provided (and it was upon the effect of this provision that the question presented in the lawsuit of which we are about to speak, chiefly arose) that if the quantity of lump coal which, on the first of May, should have been sold, should be less than half the estimated sales for the year, then the toll during that year should be calculated on the average price per ton at which the sales should actually have been made.

Under this agreement the question soon arose—*at what time were the tolls payable, in case the sales prior to May 1st fell below one-half the estimated sales for the year?*

The Pennsylvania Coal Company contended that in such a case the tolls could not be fixed under the contract until the end of the year; and that they therefore were not bound to pay any toll until the end of the year arrived. The Delaware and Hudson Canal Company on the other hand maintained they had a right to insist on an immediate payment on account, of a sum to be fixed by a proximate estimate of the tolls; though they did not deny that the amount of the tolls could only be accurately ascertained at the end of the year.

A suit was brought by the Coal Company against the Canal Company to test this question, and the decision was that the construction contended for by the Coal Company was correct. The following extract from the opinion of the court shows the reasons assigned:

CLERKE, J., after stating the facts. As a general rule, no one is obliged to perform a contract until its nature, limit and conditions are ascertained and prescribed. No debt can be legally demanded until its amount is capable of being estimated. If A engages B to go to Rome, and promises to pay all the expenses which he incurs on the route, B cannot compel payment of any portion of his expenses until he completes the journey, unless he has taken the precaution to have it expressly understood that A shall pay him the several portions of the outlay as they are incurred.

I can discover no essential difference on the point involved between such a case and that now before us, except that the latter relates to tolls, which it is said necessarily imply immediate payment. Is there, indeed, any peculiar virtue in the word "toll" which gives it so potent an effect as to lift any contract in which it is employed above the ordinary rules of construction? And after sifting this case thoroughly, and disengaging it from all irrelevant topics, we shall find that this is the only question that remains for consideration.

Does the word "toll," which is employed throughout this agreement import, *et vi termini*, an instant collection, as soon as the weight of the cargo is ascertained at the usual price?

"Toll" is a Saxon word, originally signifying a payment in towns, markets and fairs, for goods and cattle bought and sold there. It is defined in the institutes to be a reasonable sum of money due to the owner of the fair or market, upon sale of things tollable, within the same. It is now, also, popularly applied to the charges which canal and railroad companies require for the transportation of goods payable, no doubt, at once, in all cases, where there is no right or arrangement importing the contrary—precisely as goods sold are presumed to be sold for cash, unless by express terms, or from the circumstances of the case, the transaction shows a credit. The word means nothing more than a compensation for the privilege of service granted or rendered; and the period of payment depends entirely as in every other case, upon the express or implied understanding of the parties. The right of the Canal Company in this respect is not at all enlarged by the charters which it has received from the States of Pennsylvania and New York. It is, indeed, permitted by these charters to exact certain tolls and rates, not exceeding three cents per mile for every ton of ascertained burden in every vessel. But even in such cases where the rate is fixed, the toll cannot be exacted until the burden is ascertained, so that the amount payable must be certain before it can be demanded. Nothing appears in these charters impressing on the word "toll" a signification which, *et vi termini*, imports an immediate right of collection where the terms of a contract are inconsistent with it. They do not, in other words, contain any immunities to the company, shielding them from the effect of the ordinary meaning of language, as the ordinary consequences of the want of circumspection and care in the preparation of their contracts. The employment of the word "toll," therefore, does not, *et vi termini*, give the Canal Company any right to the collection of

it before its amount is ascertained. And as I have already intimated, the contract itself contains nothing from which it can be satisfactorily and legally inferred, that the parties intended, in the contingency contemplated in this clause of the agreement, that the tolls should be payable before the expiration of the year. To be sure, immediate payment is provided for in the first clause; but this is no reason why we should legally infer that this was intended on the happening of the contingency mentioned in the provision under consideration. Indeed, the presumption is at least as much in favor of the opposite supposition. In the one, immediate payment was expressly provided for, because the amount could be ascertained with certainty; in the other, it may be fairly assumed that immediate payment was dispensed with, and payment postponed until the expiration of the year, because the amount could not be ascertained with certainty until that time. And may it not be plausibly maintained, if the parties designed payment on account, by some proximate calculation, that they would have declared it? Their attention was, most manifestly, directed to the subject of payment, by contemplating the contingency; and, if they deemed it practicable and convenient, common prudence, of which we are not to presume any one destitute in matters in which important interests are concerned, would have required a suitable provision for this purpose, expressly set forth in the contract. For, assuredly, neither party would be willing to leave it to the interested conjectures of the other to make what is called a proximate estimate, without at least specifying some principles on which the computation should be made.

It would, indeed, have been more convenient for the Canal Company to receive the tolls, and it may be a very serious detriment not to have received them, as the weight of each cargo was successfully ascertained at the weigh-lock at Eddyville; on the other hand, it would be equally convenient for the Coal Company not to pay them until their amount should be definitely ascertained. So far as it may be presumed such considerations operated in the minds of the parties in making this contract, they may be deemed counterpoised, and a cautious reserve and silence might have been regarded by each as the best policy. Or, which is more likely, each might have been willing to trust to the liberality of the other, and not to rely, as to this point, on a strictly legal right. They are both respectable, wealthy, and powerful companies—not petty traders. We are not to suppose that the apprehended hazard by the retention of the dues by the other until the end of the year, or that both were not inclined to yield material favors and forbearance, respecting an arrangement likely to endure for many years, of great magnitude, and of great advantage to both. If, under the first clause, immediate payment was yielded by the one, under the contingency contemplated in the latter, a postponed payment may, with a very good grace, be yielded by the other. Generally, the Canal Company would receive immediate payment, as the method prescribed by the first clause would in the great majority of years obtain; the method prescribed in the other would be contingent and exceptional. Thus, occasionally, without any serious sacrifice of interest, it would be nothing unprecedented or extraordinary that they should wait for a few months for payment from their very safe and very profitable customer.

But, without indulging in any speculation on the possible intentions of the parties, it is enough for us to say, that the language of the provision referred to necessitates no such construction as the Canal Company demand. There is no latent virtue in the word "toll," to exempt a contract in which it is employed from the ordinary rules of construction; and a toll, like any other debt, cannot be demanded until its amount is ascertained. Nothing more clearly demonstrates the wisdom of adhering to this rule than the consequences which a departure from it would exhibit in this case. If the Canal Company are allowed to collect the tolls before their rate can be established, what amount shall be exacted and who shall determine the

amount? By a proximate estimate? By whom? Shall it be left to the arbitrary, perhaps biased, estimate of the interested party? The law abhors arbitrary power in the private as much as in the public relations. It allows no man to be a judge in his own cause—he must await the arbitrament of disinterested authority. The Canal Company demanded, as a proximate estimate, 55 cents per ton, on their own mere conjectural computation; they afterward reduced it to 50. They might as well have demanded 60 or 70. They had no more authority to demand 50, than the Coal Company had to insist on the payment of 40. Neither, in short, could coerce the other, until the amount actually payable should be ascertained in the manner prescribed in their contract.

Louisville and Nashville Railroad.

This great work, in which we are all so much interested, is rapidly hastening to completion. From one end of the line to the other the greatest activity pervades all departments. In Louisville the Company have a most beautiful depot nearly finished, a large engine house, suitable for several engines, and a machine shop, that cannot be excelled for size and completeness. The portion of the road finished from Louisville to Green river, 94 miles, is yielding a handsome profit on running expenses, besides developing the county heretofore almost out of reach. At Green river the bridge is about one-third completed. When finished, this will be the finest piece of work on the road, and, it is thought, in the West. It is built of iron, resting on stone piers, at an elevation at the centre span of over one hundred feet. The entire length of the bridge is one thousand feet.

Between Bowling Green and Green river the graduation is pushing ahead, and will be finished by the time the bridge is done.

From Bowling Green south, track-laying has been going on several months, as we have noticed in our columns. At this time it has reached Franklin, Ky. The grading is done thence to the State line, from which point to the tunnel, a short time only will be required to prepare the work for the track.

At the tunnel a large force is employed. The contractors hope to finish early in the fall.

From Gallatin, the track is progressing slowly, as but a short distance is laid down at a time, and then ballasted in a fine substantial manner. We had the pleasure of a ride over the new track a few days since, finding this piece of road equal to any we ever passed over.

It is not necessary for us to say anything about the road from Gallatin to Nashville, for all our readers are well posted on that point.

The Cumberland river bridge is now waiting for the river to fall; as soon as this takes place, the middle span will be put up.

In Nashville, depot grounds have been purchased, upon which the required buildings will be erected this summer. The work on this side is almost finished.—*Gallatin (Tenn.) Examiner.*

Chicago, St. Paul and Fond du Lac Railroad.

Under the new organization of the Chicago, St. Paul and Fond du Lac Railroad Company, work is to be commenced on the Rock river division, from Janesville to the LaCrosse junction, and the line completed and opened through from Chicago to Oshkosh during the coming season.

Chicago, Iowa and Nebraska Railroad.

The cars on the Chicago, Iowa and Nebraska Railroad were run to Bertram, seven miles west of Mount Vernon, and twelve miles east of Cedar Rapids, on the 30th day of May, and will be in Cedar Rapids by the middle of June.

Niagara and Detroit Rivers Railroad.

The Niagara and Detroit Rivers Railway Company, as organized under the recent act of the Canadian Parliament, have advertised for proposals for the construction of the entire line of the road. Tenders are to be received at the Company's office, in Hamilton, until the 18th of June. Engineers are also at work locating the line.

Cincinnati Stock Sales.

By KIRK & OHREVER.

For the week ending June 6, 1859.

BONDS.	Per cent.	and int.
Little Miami, 1st Mort.	6s....83	
Covington and Lexington, 2d Mortgage....	6s....80	
Do. do. Income	10s....12½	f.t.
Cinc. Ham. and Dayton, 2d Mortgage....	7s....85	
Indianap. & Cincinnati, do. do.	7s....85	
STOCKS.		
Cincinnati, Hamilton & Dayton	62	
Columbus and Xenia	87	
Indianapolis & Cincinnati	51	
Little Miami	89	

Railroad Earnings.

The receipts of the Grand Trunk Railway of Canada for the week ending May 21, were.....\$39,927 40
 Week ending May 22, 1858 44,228 96

Decrease\$4,301 56
 Total traffic from July 1st.\$2,036,500 07
 Same period last year 2,127,847 68

Decrease\$91,347 61

The earnings of the New York and New Haven Railroad for May, 1859, were:

From passengers, &c.....\$86,743 51
 " freight 15,250 00
 Total.....\$101,993 51
 Less due other roads..... 24,546 88

Balance.....\$77,446 63
 Receipts for May, 1858..... 68,907 86

Increase\$3,538 77

The following are the receipts of the Pittsburg, Fort Wayne and Chicago Railroad, for the month of May, 1859, compared with the month of May, 1858:

For May, 1859\$119,909 11
 Do. 1858 115,404 79

Gain in 1859\$4,504 32

The receipts of the Long Island railroad for May, 1859, were:—

From passengers\$16,557 65
 " freight 11,297 38
 " mail 685 42

Total.....\$28,550 45
 May, 1858 25,525 56

Increase, 1859\$3,024 89

The traffic of the Great Western Railway of Canada for the week ending May 27th, 1859, was as follows:

Passengers\$21,971 63
 Freight and live stock 9,573 33
 Mails and sundries 1,439 14

Total.....\$32,984 10
 Corresponding week of last year 37,819 37

Decrease\$4,835 27

The earnings of the Cincinnati, Hamilton and Dayton railroad, for May, 1859, were..\$42,086 23
 May, 1858 32,896 57

Increase in 1859\$9,189 66

The earnings of the Michigan Southern and Northern Indiana Railroad, for May, 1859 and 1858, were:

	1859.	1858.
Passengers	\$62,386 87	\$80,289 18
Freight	66,684 71	67,481 64
Mails	4,583 41	4,635 14
Express and miscellaneous,	3,363 28	35,393 80

Totals.....\$137,518 27 \$187,799 76
 Decrease in 1859\$50,281 49.

The business of the Illinois Central Railroad for May, 1859, was as follows:

Land Department.

Total sales during the month2,598.76 for \$43,996 82
 To which add Town Lot sales 1,015 45

Total of all\$45,012 27

Acres sold since Jan'y 1, 1859.15,245.78 for \$223,608 65
 Acres sold prev'sly, 1,229,835.33 " 15,637,148 95

Total1,245,081.11 for \$15,860,757 60

Construction Bonds canceled in May, 1859.....\$32,000 00

Construction Bonds canceled previously 1,048,500 00
 \$1,080,500 00

Free Land Bonds canceled in May, 1859\$6,000

Free Land Bonds canceled previously 132,000
 138,000 00

Total Bonds canceled up to May, 31, 1859\$1,218,500 00

Cash receipts in May, 1859.....\$51,580 28

Do. since Jan'y 1, 1859..... 229,965 17

Total cash and bonds received to May 31, 1859.....\$2,904,762 70

Traffic Department.

Receipts from passengers\$50,410 21

Do. freight 70,578 95

Do. mails 6,368 32

Do. rent of road 5,450 00

Do. other sources 4,982 98

Total receipts in May, 1859\$139,771 47

Do. do. 1858 161,090 34

Do. since Jan'y 1, 1859.....\$715,157 42

Do. do. 1858..... 751,460 62

The annexed are the May earnings of the Chicago, Burlington and Quincy railroad:

Freight\$59,655 75

Passengers 27,978 60

Mail and miscellaneous 1,628 33

Total.....\$89,262 68

Operating expenses estimated 50,000 00

Net earnings.....\$36,262 68

Gross earnings per mile 557 89

Between Chicago and Burlington, 210 miles:

Freight\$67,298 82

Passengers 33,303 91

Mail and miscellaneous 1,996 83

Total\$102,599 56

Between Galesburg and Quincy, 100 miles:

Freight.....\$12,893 62

Passengers 12,117 58

Mail and miscellaneous... 890 00

25,901 20

Total for 310 miles.....\$128,500 76

Earnings in May, 1858 130,995 68

Decrease in 1859\$2,494 92

Earnings per mile\$414 18

The receipts of the Hudson River Railroad for May, 1859, were.....\$141,268 92

For May, 1858..... 128,132 27

Increase.....\$13,138 65

The receipts of the Harlem Railroad Company for the month of May are as follows:

1859\$77,667 57

1858 91,868 62

Net increase.....\$14,201 05

The above are the net receipts after deducting all charges.

The following are the earnings of the Milwaukee and Mississippi Railroad for May, as compared with the same month last year:

	1859.	1858.
Freight	\$40,005 31	\$55,110 23
Passengers	19,861 11	30,410 83
Mails.....	1,835 42	1,216 66

Total\$61,701 84 \$86,737 82

The earnings of the Galena and Chicago Union Railroad Company, for the month of May, were:

	1858.	1859.	Decrease.
Freight	\$109,985	\$81,821	\$28,163
Passengers	44,286	33,900	10,386
Mails, etc.....	3,682	3,600	82

Total\$157,953 \$119,321 \$38,632

Corrected earnings for the previous month,\$88,708

The Chicago and St. Louis Railroad.

A bill is on its way through the Legislature, on the petition of L. Candee, of New Haven, and others, incorporating a company to operate the above named road out in Illinois. There seems to be a little hesitation, but no real objection, to the incorporation of the company; nor should there be, when it is considered it is an attempt of Connecticut creditors to save a portion of the million and a quarter of dollars the road owes them.

It is said that the railroad in question cost eight millions. Its annual average earnings during the last four years have been over one million. The bonded indebtedness of the road, secured by three successive mortgages, was \$4,535,000. There is unpaid bank interest on these mortgages amounting to about \$1,325,000. Of the indebtedness there is owned in this State about \$1,250,000, and a large portion of the remainder is owned in Germany. The road became embarrassed in 1855, since which time no interest has been paid except about \$57,000.

The Hartford Press states the claims of the applicants for the charter as follows: The stockholders of the road were sold out under a power of sale contained in a fourth mortgage, in December, 1856. The equity of redemption—that is, the road—was bought, subject to the first, second, and third mortgage, by Joel A. Matteson and Elisha C. Litchfield, for the sum of \$5,000; since which time they have been in possession, and have received, down to October, 1858, when they stopped publishing the receipts of the road, the sum of \$2,024,407 30; and notwithstanding these large receipts, they have paid only \$57,000 towards the interest they have agreed to pay.

Proceedings for the foreclosure of the first mortgage were commenced in the courts of Illinois in October, 1856; the petition was answered by Matteson and others, and petitions, cross bills, and interpleaders, were filed by several other parties in interest. The bondholders have not been able to get a trial on the merits, and Matteson says he can postpone them, at least, two years longer, keeping possession of the road, and its income, all that time.

A suit for foreclosure on the second mortgage was commenced about the same time—October, 1856, and is in the same complicated state as the first. In October, 1858, a suit was commenced to foreclose the third mortgage, which has come to a dead lock, like its predecessors. No result is likely to be rendered within a reasonable time, except by the consent of parties. There is, also, a joint suit on behalf of all the mortgages pending in the U. S. Court for the District of Northern Illinois; this was commenced in the summer of 1858, and has not yet been reached in its order on the docket, on its merits.

With all these complications, and enormous expenses, already more than \$40,000 upon the bondholders, they have attempted and agreed upon a compromise by which they can have the road and all its income, as soon as they are prepared to take it, and to pay the bonus required by the terms of

the compromise. They cannot take it now for want of a proper organization.

The Legislature of Illinois does not meet until January, 1881. In the meantime, the road and its franchises is to be sold by order of Court under the third mortgage. The creditors deem it absolutely essential that they should be organized and prepared to operate the road as soon as they can get it, and prepared to buy it at the contemplated sale, so that other speculators, like Matteson, may not step in and plunder them further.

The creditors are among our most respectable and substantial citizens, embracing all classes, savings banks, trust funds, and benevolent societies, farmers, merchants, lawyers, maiden ladies, and widows.—*New Haven Herald.*

American Railroad Journal.

Saturday, June 11, 1859.

New York and Erie Railroad.

The competition between the "four great lines" is raging with greater violence than ever. On Tuesday of this week, the Pennsylvania Railroad reduced the rate of passenger fare from New York to the points named, as follows:

	Old.	New.
To Cleveland	\$13 00	\$8 00
" Chicago	23 00	12 00
" Columbus	17 00	10 00
" Crestline	15 25	9 00
" Cincinnati	20 00	13 25
" St. Louis	30 00	23 25

We take it that the New York Central will follow suit, and the Erie too. She is entered for the race, and must make time, or be distanced and disgraced.

Where is this wretched business to end? One result is clear. Unless soon put a stop to, it will prove the destruction of the Erie Railroad. This is certain. Let us see how it stands.

The comparative earnings of this road for the first seven months of the year were as follows:

	1859.	1858.
October	\$456,226	\$449,685
November	436,898	429,900
December	392,292	474,618
January	304,707	376,356
February	301,593	378,455
March	364,296	461,494
April	380,342	558,129
	\$2,636,354	\$3,131,679
		2,636,354

Loss in seven months

The amount of falling off for the remaining five months will probably be still greater; so that the total gross earnings will be a million, at least, less than for 1858.

The total earnings for that year were, say \$5,100,000; current expenses, \$3,900,000, leaving as net earnings, \$1,200,000; or only about \$200,000 beyond what will probably be the current expenses for the present year; for the late report of the company gave no encouragement that they were to be materially reduced.

The action of the company still further illustrates its complete financial prostration. It is reported to have abandoned all idea of making, for the present, further payment of interest upon its funded debt. Whether this is true or not to the full extent, there is no doubt of its being true as to all classes of bonds, after the second mortgage. The company is completely broken. It has neither means for present necessities, nor, while the pre-

sent contest continues, any better prospect for the future.

What is to be done? The thing to be attempted is to compose the present disputes, and to restore, as far as possible, the traffic that the company once possessed. But how? And here we come to the very point at issue. Can this salvation come from Mr. Moran? We do not see how it is possible. Have we any reason to expect anything better for the future than the past. Under Mr. Moran's administration the road has steadily fallen off in its earnings, lost in public confidence, while its managers have been embroiled in disputes and quarrels, which have assumed such a degree of personal animosity, that we do not see how, the parties to them maintaining their present positions, they can ever be composed.

When a person takes the responsible position of the manager of a railroad, the duty he owes to the public is *success*. The degree of his success measures his qualification for the place he fills. Faithfulness to one's ideal is nothing, unless this leads to success—unless this lies at the goal, adherence to an ideal is unpardonable egotism.

Now it is clear that Mr. Moran's administration has not been a *success*. Far from it. It has been a dead failure. In every particular, we believe, except in the condition of the road, upon which a large portion of the earnings have been expended, does it stand in worse relations than when he took charge of it. We do not question the purity of his motives, nor that he has done many things well. While he made the most strenuous efforts to inaugurate, if we may use the term, an honest administration, we have no doubt that his, on the whole, has been much more expensive than there was any need of being, and as expensive, and probably more so, than any of his predecessors. One great reason for this has been, that he has not been properly supported. In the outset, he assumed the duties of President and Superintendent. Both are still vested in him. His influence has overshadowed every department of service. Now, while his influence was everywhere felt, he could not wisely direct all, nor exact from each department a proper degree of accountability. There is no doubt that the work and materials bestowed upon the track the past year cost the company a sum much larger than, under suitable superintendence, they would have cost. We give this as an illustration. How could it be otherwise? Mr. Moran is not such an expert as to know what is a proper compensation hardly for any kind of service rendered the company. He could not help being imposed upon.

It is easy to be wise after the event. We claim a little *foresight* in this matter. In the first number of the JOURNAL after Mr. Moran took his seat, nearly two years since, we commented upon his election in the following style:

"NEW YORK AND ERIE RAILROAD.

"MR. CHARLES MORAN has been elected to, and accepted the Presidency of the New York and Erie Railroad.

"MR. MORAN possesses many excellent qualities for his new position. He has energy, is capable of great labor, and will, we have no doubt, serve the company with entire fidelity.

"THE effect of this appointment upon the value of the securities of the company is yet to be seen. We have no doubt he will conduct their finances with ability. But this is by no means all that is to be done. To succeed in bringing relief by the

creation of *new* loans will, in the end, only add to the company's embarrassments, unless at the same time the operations of the road shall be so conducted as to secure the largest possible income.

"MR. MORAN's success, therefore, will depend upon the persons that he shall associate with him in the practical management of the road. His previous training has not fitted him for the discharge of such duties. His appointment is well so far as it goes. *But the changes and appointments are yet to be made, upon which final and complete success depends. He must associate with himself gentlemen of mature experience, and of the highest qualifications in railroad management, if he would have his administration reflect credit upon himself, and prove beneficent to the stock and bondholders.*"

So far from associating with himself gentlemen of "mature experience, and of the highest qualifications in railroad management," there has been a gradual weeding out of the best men found in the company when Mr. Moran took his seat as President. Not a single place, as far as we can learn, has been filled with first class men, possessed of experience, and fitted to command the confidence of the public. Had Mr. Moran selected competent assistants and advisers, his company would have been in a very different position from the present one. We have frequently commented, in a mild manner, upon a tendency which he undoubtedly has, of trusting entirely to his own convictions, and of turning a deaf ear to everybody else; but all to no purpose. We think now we are justified in using a little stronger tone. We spoke as plainly before his career commenced. The end has justified our apprehensions.

There is one matter connected with Mr. Moran's presidency to which we have never referred in a manner calculated to wound any one's feelings; but which, we are satisfied, has been one great cause of his want of success—we mean his salary of \$25,000. There were two relations that Mr. Moran could have occupied toward the company—that of a public spirited man, standing ready to lend a helping hand, and to make a personal sacrifice for a great public enterprise, especially one in which he has induced his friends to invest, and which was threatened with danger; or that of an *expert*, who brings great qualities and a valuable experience to its aid, for which he expects a corresponding compensation. But Mr. Moran has taken a compensation exceeding two and a half times that ever given to the most competent expert in the United States, while he brought to the road only the capacity of *becoming* one by the exercise of the duties that fell upon him after assuming his new position. If he came to the rescue of the road as a *friend*, then he should have been the first one to make a display of a great sacrifice of time, or money, or labor for its good, as an example for the emulation of others. But if he did not choose to make such sacrifice, but to receive a compensation equivalent to his qualifications and reputed experience, then he demanded and has received a sum altogether disproportionate to his merits. There is an entire want of fitness in the whole thing. It has done more to demoralize the company than all other causes together. Just see how it works—

A gentleman, a banker, without a day's experience on a railroad, is suddenly placed in the position of chief executive, receiving a compensation more than twice as great as ever before paid to the most experienced person in a similar position, and five times greater than even paid to a person

having no greater pretension. By necessary implication it was a direct disparagement, not to say insult, to every person who had for a considerable time been in the service of the company. Especially was it so felt, when a general reduction of compensation was soon after decreed. Take the case of a person who had been in the company's service, say for ten years, and had served it faithfully all that time, for a salary of a thousand dollars. Without increasing it a penny, and without any recognition of his qualities, a person without any experience is placed over him, with a pay, relatively ten times greater than he receives. He feels that injustice is done him. His self-respect is wounded. He ever after labors under the idea that he receives an insufficient equivalent for his services. Such a conviction will end in reducing their value, in his estimation to the compensation he receives. If he be wanting in principle, he will shirk his duties. If he has an opportunity, he will appropriate to himself the means of the company. Mr. Moran is loud in his complaints of being defrauded. If such be the fact, the parties to the frauds justify themselves with the idea that they are only raising their compensation to a level with his own. Such an extraordinary measure as a salary of \$25,000 for a novice, has its legitimate influence, which, in the present case, has been most disastrous, in the manner described. It has been most effectually used by the public, and by the enemies of the road to cover it with ridicule, and to bring it into contempt. Mr. Moran's uncompromising views have tended to stimulate this disposition. Ridicule is a most potent weapon, and may be used with as much effect against a railroad company as against an individual.

In conclusion, we see but one way in which the Erie railroad can be saved. It must go into new hands, who must bring to its management just those qualities that secure the highest degree of success in other undertakings. The policy we marked out last week, we are convinced, is the only one that will do any good. It is no use to go on any longer in the old way. No body of directors can lift the road out of the slough in which it lies. They cannot communicate the right kind of life to it. The road must, in effect, become equivalent to a private property. If anything is to be saved, the stock and bondholders must act, and promptly. If on the other hand, all hope of saving it is to be given up, it may as well be left where it is.

Galveston, Houston and Henderson Railroad.

A bridge is now being constructed from Galveston Island to the main land, a distance of about 9,000 feet, for the accommodation of the above road. The depth of water is from 6 to 7 feet. The bridge is to be completed the present year. The distance from Galveston to Houston is about 50 miles; of this distance about 5 miles of railroad on the Island has to be built; the other portion of the road being in operation.

Dayton and Michigan Railroad.

The opening of this road to a junction with the Pittsburgh, Fort Wayne and Chicago Railroad, at Lima, was formally celebrated on the first instant. A new route is thus opened between Cincinnati and Chicago. The road will soon be extended to Toledo.

Chicago and Rock Island Railroad.

One of the most extraordinary reverses in the railroad enterprises of this country has been the Chicago and Rock Island road. In 1857, if the Reports of the Company are to be credited, the gross earnings amounted to \$1,886,196; these fell off in 1858 to \$1,407,845. The comparative earnings, copied from the Chicago Press, for the first half of the current fiscal year were as follows:

	1857.	1858.
July	\$149,911	\$82,374
August	153,849	83,384
September	197,011	94,965
October	168,540	92,719
November	128,341	73,883
December	90,309	60,218
	\$887,961	\$487,583
	487,583	

Falling off.....\$400,378
—or equal to 45 per cent.

The earnings for the last half of the fiscal years of 1857-8 were as follows:

January.....	\$72,041
February.....	67,307
March.....	92,063
April.....	92,120
May.....	80,594
June.....	90,043

Total.....\$494,172

A similar rate of decrease for the last, as for the first half of the year, would leave \$271,700 as the total earnings for six months, making the aggregate for the year \$759,455. The per centage of decrease has been less, and we estimate the gross earnings for the six months at \$344,000, making a total for the year of \$831,583; a sum less than the earnings of 1857 by \$1,054,613!

The cost of operating the road for 1858 was stated to be \$778,816; paid interest on bonds and on the Bureau Valley lease, \$224,715; making the total for these two items \$1,003,531, or \$171,948 more than the probable receipts for the current year. Add to this, the increase in the construction account for the past year \$147,854, the whole deficit will be \$319,802.

That the deficiency will equal this sum, we have little doubt. It is well known that the road was most wretchedly constructed, and requires constant and expensive renewals. It is hampered with the Rock Island Bridge, and has already guaranteed bonds to the amount, we presume, of \$200,000, bearing 10 per cent. interest, on account of it. How much more it may be called upon to pay, we have no means of knowing.

In view of this state of affairs, the lease of the Bureau Valley Railroad appears in its full enormity. This branch takes annually \$125,000 out of the net earnings of the main line. It stands directly between the stockholder and his dividend.

Such being the case, immediate steps should be taken to set it aside. It was a contract in which a portion of the directors of the Rock Island Company had a direct pecuniary interest hostile to that of their wards—the stock and bondholders of this road. We take it that no trustee can make a valid contract for his benefit, at the expense of the parties for whom he acts. This is a well settled principle of law, and we have no doubt it would, if properly invoked, set aside the obnoxious contract referred to.

To cover up as deep as possible the memory of this shameful transaction, the reports of the Rock

Island Company are always silent as to the cost, earnings, and cost of operating, the Branch. No one outside the company knows what these are, or have been. All that is known is, that the road was in an unfinished state, when the lease was taken, and that on this account it was stoutly opposed by some of the directors, who unfortunately were in a minority. Since that period all is blank. We have no means of knowing how much was expended on the Branch when the lease was taken. It is 47 miles long. The price at which it was taken was within a few dollars of \$1,800,000, the interest of which is \$125,000, or very nearly \$40,000 per mile, for what cost the contractors probably not \$15,000 per mile!

The reports of the company are equally silent about its relations to the Rock Island Bridge, although the company has a large pecuniary interest in it. The whole truth in this case, could it be told, would very likely reveal another Bureau Valley affair. No one, however, among the stock and bondholders seems to have interest or force enough, to make the directors open their mouths. The road was apparently made for these parties instead of its unlucky owners.

Artificial Illumination of Cars.

An important desideratum connected with the equipment of cars is the means of illumination at night. Oil is open to very serious objections for obvious reasons; volatile fluids are dangerous; candles are troublesome; all far more expensive than gas. The most modern system of gas-lighting in cars, that of taking in the gas at the ordinary street pressure, and expelling it by machinery rather than by its own force, seems likely to become the most popular. The smoking cars of the night express train between this city and Boston, via New Haven and Springfield, support two burners each on this system, and a passenger car on the Boston and Lowell road has just been provided with a similar apparatus, all of which are represented as working very efficiently and satisfactorily. The system of compressing gas by a pump into small cylinders as practiced on the Camden and Amboy and some other roads, is also working very finely, but the "low pressure" system requires none of the machinery therein necessary for charging. The Boston cars are charged in a few minutes, by connecting a common flexible hose to the street main, and allowing it to flow, while the "high pressure" system requires the working of force pumps by steam power for a long period to effect its compression. Whether the clock-work required by the low pressure system for expelling the gas is likely to become deranged is a question that can only be settled by long trial, but the system has been used two years on all the Jersey City ferry boats, and down to this date, we have heard of no difficulty in connection therewith.

The gas-holder for railroad cars is a sheet iron box, of large area but little depth, and containing some 50 or 60 cubic feet of gas. It is mounted beneath the floor of the car in the centre, and provided with suitable connections and valves. A hose, diaphragm of rubber, or similar material, extends horizontally across, and the gas, when admitted below from the mains, elevates it without difficulty, expelling all the air above through an open cock. This is the operation of charging. A clock spring connected with a common day meter

fact illustrates the vast extent of our internal trade, which probably exceeds twenty times the amount of our foreign trade.

The tonnage caused by the railroads of Massachusetts, proves that we have not over-estimated the value of its products. These works in 1858, transported 3,369,270 tons of freight. If we reduce the above amount by one-half, for tonnage duplicated on other roads, we have 1,684,635, as the actual tonnage of the roads. The value of this tonnage will exceed \$250 per ton, or \$420,000,000 the value of the articles enumerated, will exceed \$500 per ton; leather is worth \$500; boots and shoes \$1,000 per ton; cotton and woolen goods, a still larger sum.

We doubt where there is an equal number of people in any country so well and profitably employed as those of Massachusetts. With the poorest soil of any, and in many respects, in an unfavorable geographical position, she has made herself by industry, the richest and most prosperous community in the world.

Houston and New Orleans Railroad.

The portion of this road lying within the State of Texas seems to be making rapid progress. We copy the following in reference to the same from the *Houston Telegraph*:

A force of 220 men are now at work, under the direction of Mr. Smith, of the firm of Wentz & Co., railroad builders, of great force, means and experience. Their operations commenced near the town of Beaumont, in the county of Jefferson, on the 10th of May, 1859. They are working on both sides of the Neches river, and on the 21st commenced laying the track on the west bank. The Engineer Corps are laying out the work to the Trinity river, so as to connect with the company's works from Houston east. One cargo of rails, chairs, spikes and other material, 350 tons, has been landed on the line of the road, having been sent from Cardiff, Wales, and received in Galveston by the brig Clyde. The company is daily in receipt of supplies of material from the North and Europe. The distance between Houston and the Trinity, at the town of Liberty, is thirty-six miles; from the Trinity to the Neches river, forty-four miles. It is designed the road shall strike the Sabine about three miles from the town of Madison.

The bridge across the Trinity will be about 400 feet in length, with a draw sufficient for the passage of vessels in that trade. The timber for bridge and trestle work is now in preparation at convenient points along the line. The length of the road to the Sabine, from Houston, is 96 miles. With the men, means, State aid and appliances, amounting to \$1,000,000, the work may be completed to the confines of Louisiana in two years. There is plenty of timber along the line for ties, bridges, and trestle work; there is very little deviation from a level from one point to the other. Comfortable quarters have been prepared for the workmen, and sanitary measures adopted for the preservation of their health; and the contractors, engineers, and whole force will be of the most effective kind, having a thorough organization and proper discipline, so essential to carry on the work with vigor.

The New Orleans *Bulletin* states that Mr. A. M. Gentry, President of the road, visited England last fall and succeeded in disposing of the bonds of the company sufficient to provide for the purchase of the iron for the whole length of the road. A portion of it has already arrived from Wales, and the remainder will come as fast as it may be wanted.

The entire distance to be built is 336 miles. Of this distance, 100 miles lie within the State of Texas, the Opelousas Railroad (in operation,) is to be used for 80, there remains to be provided for

in Louisiana 156 miles, the means for which must come chiefly from New Orleans. It is a work of very great importance, and we should suppose that an interest in behalf of it could be awakened in New Orleans that would end in supplying the necessary aid. The route is a very favorable one, and would bring to that city a vast accession of trade, and would greatly strengthen her commercial position. Texas, in area, is a half a dozen States. Houston is the focal point for her railroad system. A railroad which is to connect this with the great Southern Metropolis could not fail to have a lucrative business.

Illinois Central Railroad--Its Locomotive Department.

The following Statement will show the operations of the locomotive department of this road for the month of April:

Total miles run	156,300
Pounds of waste used	1,863
Gallons of oil	1,366
Cords of wood	2,870
Tons of coal	1,027
Wages of engineers and firemen	\$6,028
Repairs of engines	8,388
Value of waste and oil	1,279
" " wood and coal	14,097
Cleaning engines	1,085
Total expenses	30,880
Value of oil and waste used per mile	8.2
" " wood and coal	9.02
Wages of engin'rs and fire'n	3.80
Cost of repairs	5.36
" " cleaning engines	6.9
Total cost per mile run	19.75
Average number of miles to pint of oil	14.30
" " " " cord of wood	42.
" " " " ton of coal	35.

Henderson and Nashville Railroad.

The town of Hopkinsville has subscribed \$50,000 of stock in the Henderson and Nashville Railroad, payable when the grading of the road shall have been finished to Hopkinsville from the Tennessee line, on condition also that \$65,000 be raised by subscription, for the purpose of ironing the road in that county.

Pacific Railroad of Missouri.

This Company are prepared to pay the interest on all the bonds issued by it, and due July 1st. The work of construction is making vigorous progress, both on the main line and south-west branch.

Quincy and Palmyra Railroad.

The branch to connect Quincy with the Hannibal and St. Joseph Railroad, at Palmyra, is nearly completed. When opened, a direct line by railroad will be formally between the east and the Missouri river.

Fayette County Railroad,

We learn from the *Pittsburg Post* that the first division of the Fayette County Railroad has been opened, and that an excursion train run between Connellsville and the Union Iron Works. In a few months the road will be completed from Connellsville to Uniontown.

Cumberland Coal and Iron Company.

The annual meeting of this Company was held in this City on the 6th inst. The following gentlemen were elected Directors for the ensuing year, viz.:

President, CHARLES GOULD; Directors, Robert P. Getty, Allan Campbell, Samuel J. Tilden, Nathaniel Marsh, William F. Havemeyer, David Palmer, Edmund H. Miller, Columbus Seguire, Benjamin Nathan, J. Hall Pleasants, Baltimore; Charles M. Connolly, Frederick Kuhnz.

Memphis and Little Rock Railroad.

The greater part of the line of the above road, from the Mississippi to the Arkansas river, is under contract.

To Railroad Contractors.

NIAGARA AND DETROIT RIVERS RAILWAY COMPANY (OF CANADA).

In pursuance of the statute in that case made and provided, notice is hereby given that tenders for the construction of this company's railway will be received until noon of Saturday, the 18th of June next.

Further information and the necessary printed form of tender may be obtained on application at the office of the company in Hamilton, Canada West.

The tenders to be endorsed "Tender for the construction of the Niagara and Detroit Rivers Railway," and to be sealed and addressed to the secretary, at Hamilton, Canada West.

The Directors, under the provisions of the said statute, will not bind themselves to accept the lowest, or any tender. By order.

W. LYNN SMART, Secretary.

HAMILTON, Canada West, May 17, 1859.

Railroad Iron.

THE undersigned have American and Foreign Railroad Iron for sale, deliverable in New York and other markets.

CASWELL & PERKINS,

Brokers, 69 Wall st.

New York, January 1, 1859.

LOCOMOTIVES.

2 LOCOMOTIVES, about 15 tons, (second hand,) 4 ft. 8 1/2 in. gauge, in excellent order for sale at a bargain.

GEO. T. M. DAVIS,

New York, May 24, 1859. 2nd 47 Exchange Place.

WEISSENBORN'S PATENT

Incrustation Preventer FOR STEAM BOILERS.

EFFECTUALLY obviates the Formation of Scale on the Plates by separating the incrusting matter from the water before it enters the boiler, at the same time condensing a large portion of the steam and supplying the purified water to the boiler at about boiling heat. The apparatus is compact, simple, and applicable to all kinds of Engines. Recent modifications render it still more efficient than heretofore. Testimony as to its successful operation in preventing scale, and also as a HEATER AND CONDENSER, can be furnished by the subscriber.

Probably no modern improvement connected with Steam Power combines so many advantages as this. The economy of Fuel alone from its use soon repays the cost of the apparatus. Prices reduced. Terms easy.

STEWART KERR, Engineer, Agent, 15 Broadway, NEW YORK.

Notice to Bridge Builders.

ENGINEER'S OFFICE, C. & S. R. R. Charleston, May 23, 1859.

SEALED PROPOSALS WILL BE RECEIVED AT THIS Office until 12 M., on Saturday, 18th June next, for the construction of a single-track railroad Bridge across the Savannah River, about thirteen miles above the City of Savannah.

The said Bridge will have (6) six spans of (144) one hundred and forty-four feet each; and a swing bridge (190) one hundred and ninety feet long, (giving two openings of 80 ft. each.) The entire length of the Bridge will be about (1070) one thousand and seventy feet.

The superstructure of the Bridge to be of the most substantial character, and on the plan of Howe's Patent Truss. The piers and abutments to be composed of cast-iron cylinders, (6) six feet in diameter; sunk by Pott's pneumatic process, through an average depth of (20) twenty feet of mud, sand, and gravel, and securely based upon the impenetrable substratum which underlies the bed of the river.

Proposals will be received at the same time for constructing the said Bridge on piers and abutments of brick, resting on piled foundations.

The plans and specifications, bills of timber and iron, may be seen, and all other information obtained, at this office, on and after Monday, 6th June.

EDWARD MANIGAUULT, Chief Engineer, C. & S. R. R.

FOR SALE.

2,250 TONS English Rails, (flat), 54 lbs. to the lineal yard, Erie pattern, Bars 24 feet long. Terms, CASH. G. O. T. M. DAVIS.

New York, June 1, 1859. 4123 47 Exchange Place.

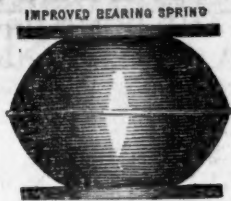
OFFICE OF THE ILLINOIS CENTRAL R. R. Co., New York, May 25, 1859.

THIS COMPANY is now prepared to receive payment in full upon its capital stock, as set forth in the circular addressed to the shareholders on the 6th of March last.

The Freedland Bonds and all other obligations of the Company, except the Construction Bonds, due in 1875, will be received at par, and accrual interest in payment of the balance of \$40 per share now unpaid.

Certificates of full-paid shares will be issued, upon which the Company will pay an interest dividend of TWO DOLLARS per share semi-annually, upon the conditions recited in the circular. By order of the Board.

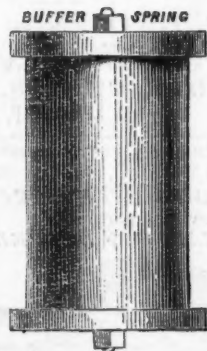
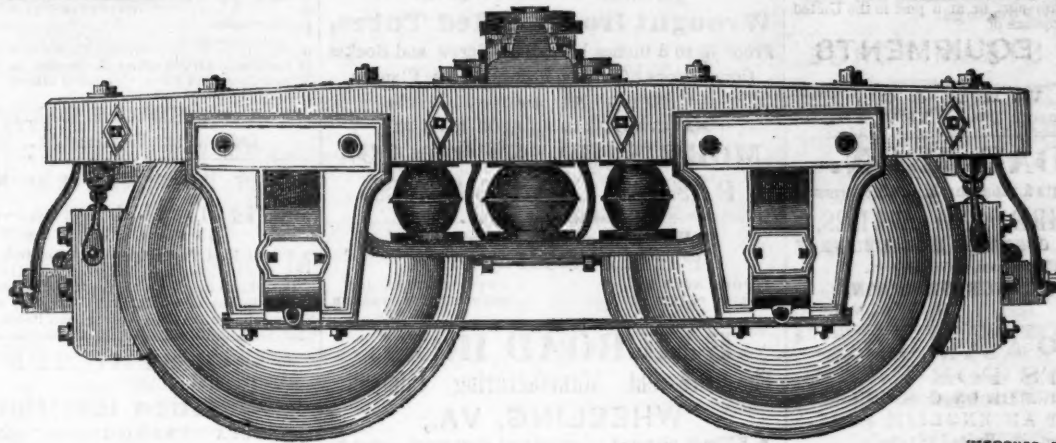
J. N. PERKINS, Treasurer.



New England Car Spring Co.

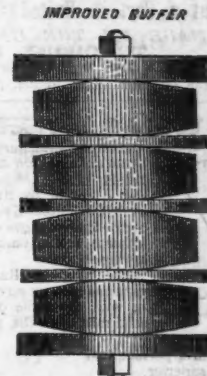
SOLE MANUFACTURERS

OF THE



India Rubber Car Springs.

OFFICE, 61 CHAMBERS STREET,
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The cost of the fuel delivered to the furnaces is but two and
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Attached to the mill is a WIRE FACTORY and its
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The extraordinary cheapness of the fuel, and the
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THE UNDERSIGNED,
Sole Agents to Messrs. GUEST & CO.,
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Steel of every description—also, Cast Steel Files of high repa-
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The Undersigned, Agents for the Manufacturers,
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RAILS OF SUPERIOR QUALITY,
And of Weight or Pattern as may be required.

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WOOD, MORRELL & CO.,

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Situated at JOHNSTOWN, CAMBRIA CO., PENNA.,

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RAILS of any required pattern or weight, on the most
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THE RENSSELAER IRON COMPANY,
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OFFER Rails of their own manufacture deliverable as may
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Eric Rails, 57 to 58 lbs. per yard, on hand in NEW YORK and NEW ORLEANS.

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CONTRACTS FOR RAILS, AT A FIXED PRICE OR ON COMMISSION, DELIVERED AT AN ENGLISH PORT, Or at a Port in United States, WILL BE MADE BY THE UNDERSIGNED, **THEODORE DEHON,** 10 Wall st., near Broadway, New York. 500 tons T rails on hand 54 to 57 lbs. per linear yard.

TUBULAR RAIL.

Railroad Managers will be interested by an examination of the "TUBULAR RAIL," patented in Europe and America by STEPHENS & JACKSON, Covington, Ky. These rails have decided advantages over any rail hitherto made, among them the following:—
The "Tubular Rail" of 50 lbs. per yard has greater strength and elasticity, with the same outside surface as solid rails of 60 lbs. per yard.

Its density is greater,
Its welding nearer perfect, and
Its durability superior.
Unlike other new forms of rail, it can be put down on the same chairs, and with the same fastenings, used with common T rails.

The arrangements to manufacture are such that these rails can be furnished of any American or Foreign make. Reference is made to the officers of all the railroads in the vicinity of Cincinnati.

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The Subscribers, Agents for the Manufacturers, ARE PREPARED TO CONTRACT FOR THE DELIVERY OF RAILROAD IRON AT ANY PORT in the United States or Canada, or at a shipping port in Wales.

WAINWRIGHT & TAPPAN,
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RAILROAD IRON MILL COMPANY,
CLEVELAND, OHIO,
MANUFACTURERS EXCLUSIVELY OF
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THIS is a new ROLLING MILL, having been working only eighteen months, and confined to work for roads on this line between Buffalo and Chicago in re-rolling old Rails. The capacity is Forty Tons per day. It is well situated for receiving old Rails, either by Railroad or Lake.

Orders are now solicited

From Roads in other sections of the country; and work will be made with New Iron in the hands, if desired.

Apply to

ALBERT G. SMITH,
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February, 1852.

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WELSH or Staffordshire make, delivered on board at an English port or at a port in the United States.

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And 17 Nassau st., New York.

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Lap-Welded Boiler Flues, 1½ to 7 inches outside diameter, cut to definite length, 2 to 20 feet as required.

Wrought Iron Welded Tubes, From ½ to 5 inches bore, with Screw and Socket Connections. T's, L's, Stops, Valves, Flanges, &c., &c.

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Established 1821.

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THOS. T. TASKER, JR.

CHAS. WHEELER, JR.,
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RAILROAD IRON.

The Crescent Manufacturing Company,
WHEELING, VA.,

ARE now prepared to execute, at short notice, orders for Rails of any required pattern and weight, and to re-roll old rails, on the most liberal terms. Address

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IRON MERCHANTS,
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IRON AND STEEL

IN ALL THEIR VARIETIES.

BOILER PLATE, CAR AXLES,
BOILER RIVETS, RAILROAD IRON,
OUT NAILS AND SPIKES, PIG IRON, etc.

Having the selling agency of a number of the Rolling Mills Furnaces and Forges in this State, orders for any description of Iron can be executed.

August 16, 1854

1y33

LACKAWANNA
IRON AND COAL COMPANY,
SCRANTON, LUZERNE CO., PA.

By the completion of the Delaware, Lackawanna and Western Railroad, this Company are enabled to obtain the Magnetic Ores from the most celebrated mines in New Jersey, which used in combination with their native ores, produce a quality of iron not surpassed.

These works have been greatly enlarged the past year, and are, therefore, prepared to execute orders promptly for RAILROAD IRON of any pattern and weight, Car Axles, Spikes, and Merchant Iron. They have on hand patterns for T rails, of the following weights per linear yard, viz:—25, 30, 36, 40, 45, 50, 60, 62, and 75 lbs.

Samples of Rails and Merchant Iron may be seen at the office of the Company, 46 Exchange Place, New York.

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DAVID S. DODGE, Treasurer,
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RADLEY & HUNTER'S CELEBRATED NEW INVENTION is now offered to the public as a **Perfect Spark Arrester**, which possesses the advantage over ALL OTHERS of being of the most simple construction, and much more durable than any ever used. The manufacturer invites an examination of this Arrester by the Railroad public, confident that it will meet with universal approbation.

The undersigned hereby gives public notice that he is the **sole manufacturer** of the above article under the Radley & Hunter Patent, of whom alone they can be purchased in the United States.



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Leather Belting and India Rubber Hose.

PHILIP F. PASQUAY,
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MANUFACTURER of Superior Oak Tanned Stretched and Riveted MACHINE LEATHER BELTING. Best Lace Leather and Steel Hooks, always on hand; also Dealer in Vulcanized India Rubber Goods—viz, Croton and Steam Hose of all sizes. Steam and Piston Packing.

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MANUFACTURERS OF
TRANSITS, LEVELS,
RODS, CHAINS, ETC.
No. 27 FULTON SLIP, N. Y.



ENGINEERS' AND SURVEYORS' INSTRUMENTS, MADE BY
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Surviving partner of
STANCLIFFE & DRAPER,

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MANUFACTURERS of Engineers' Levels, Transits, Chains, Tapes, &c. Priced catalogues by mail gratis.

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THE IMPERIAL LUBRICATING OIL,

MANUFACTURED BY

J. C. HULL & SONS,

(Formerly W. HULL & SON.)

Nos. 108, 110, 112, 114, 116 & 118 Cliff St.,

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**For Railroads,
Machine Shops,
Steamships,
Mills, etc.**

THIS OIL having been before the public for a long time, and having been extensively used in different parts of the country, and on each occasion meeting with unqualified approval, renders the manufacturers confident when making the following claims:—

1st. Its first cost is much less than that of any Oil in use, of known merit or acknowledged worth.

2nd. It will not in any way gum or clog up any journal or bearing, all the gum in the Oil being entirely decomposed.

3rd. It will keep all journals and bearings cool, clean and bright as new, thus not only saving wear and tear, but saving also no inconsiderable amount of motive power.

4th. It is fully as durable as any Oil in the market, and consumers are invited to make their experiments on such journals as are inclined to heat up.

5th. It is sweet and clean, and entirely free from all odor or unpleasant smell.

6th. It will remain limpid at as low a temperature as sperm.

CERTIFICATES from a large number of Railroad and Steamboat officers, also, prominent Manufacturers and Machine Builders, can be seen by application as above.

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Sperm, Whale and Elephant Oils,
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FOR RAILROAD CARS
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THIS celebrated GREASE has been in use upwards of Ten years; and is in the opinion of FORTY RAILROAD COMPANIES, whom we regularly supply,

The Cheapest and Best Lubricator in use.

Parties ordering, will please state the kind of box, or description of machinery.

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OIL! OIL!

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IMPROVED ENGINE and SIGNAL OIL,

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PRACTICAL TESTS, by Engineers and Machinists of Thousands of Gallons, prove this Oil to be superior for Burning, and TWENTY-FIVE per cent. more durable than Sperm Oil, for Lubricating, and the only Oil that is in all cases reliable, that will keep bearings cool, and

WILL NOT GUM.

In no case has it failed to meet the approval of the consumer.

The Scientific American and Manufacturer's Journal, after testing this Oil, pronounce it superior to any other for Lubricating.—For sale ONLY by the Inventor

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Railroad Materials, Locomotive and Car Findings,
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Baggage Checks, Barrows, etc., etc.,

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LANTERNS OF ALL DESCRIPTIONS,

ENGINE, STATION, AND SIGNAL BELLS,

Superior Car Upholstery, etc., etc.

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Orders solicited, promptly filled, and forwarded with despatch and care at the manufacturers' lowest prices.

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RAILROAD & STEAMBOAT SUPPLIES,

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LOCOMOTIVES AND CARS.

Rails, Sleepers, Chairs, Spikes, Wheels, Axles and Tires.

BOILER TUBES AND FELTING,

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CAR, SHIP AND BRIDGE BOLTS.

Locomotive, Hand and Ship Lanterns; Car Trimmings of all descriptions. Steam and Water Gauges; Signal Bells, etc., etc.

AGENTS FOR CAR HEAD LININGS.

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RAILROAD IRON,

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CAR WHEELS,

AXLES, CHAIRS,

SPIKES, TOOLS,

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All inquiries in reference to the above articles will receive immediate attention.
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Car Trimmings, Paints, Oil, Varnish, Car and Switch
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IRON FORGINGS OF VARIOUS KINDS, ETC., ETC.
STEEL AND RUBBER SPRINGS,
LOCOMOTIVE AND HAND LANTERNS,
PORTABLE FORGES AND JACK SCREWS,
COTTON DUCK FOR CAR COVERS,
BRASS AND SILVER TRIMMINGS.

Also, Sole Agents for the Manufacturers of Car Head Linings.

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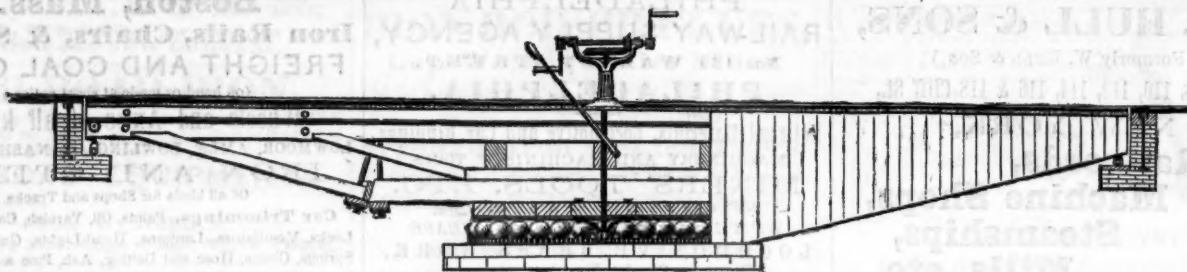
For Allen's Iron Turn Tables, Dury's Patent Blower,
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RAILWAY SUPPLIES GENERALLY.

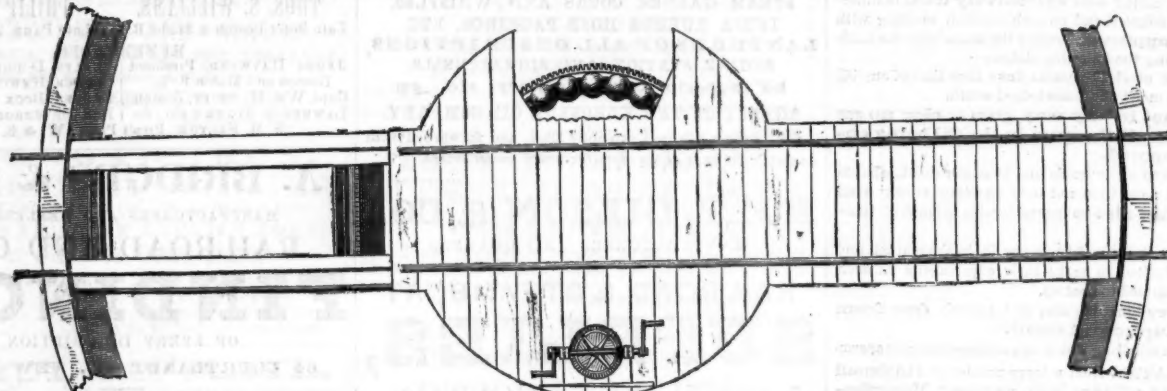
ALSO DEALERS IN

NEGOTIATORS OF SECURITIES.

WARD'S PATENT SELF-CENTERING TURN-TABLE.



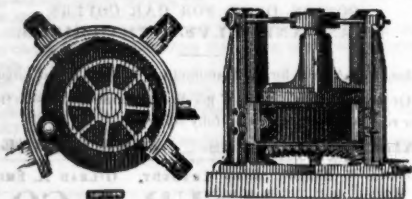
THIS TABLE is adapted to all localities and climates—is constructed without the **Central-Pivot**, or **Rolling Journals**, thereby improving with use.—It is **cheap, strong and durable**, and works with **ease and freedom**, requiring less expensive foundations, and suitable for the turning platforms of swing-bridges, mortar-beds, pivot-gun-carriages, etc.



These TABLES are already introduced, and give general satisfaction.—They are manufactured in TOLEDO, Ohio, by **R. F. RUSSELL**, of the "Toledo Novelty Works," and in ALEXANDRIA, Virginia, by **THOMAS S. JAMEISON**, to either of whom orders may be sent, or to the undersigned, patentee, at AUBURN, Cayuga County, New York. May 2nd, 1859.

W. H. WARD.

HENRY BURDEN'S PATENT REVOLVING SHINGLING MACHINE.



THE subscriber having recently purchased the Right of this Machine for the United States, now offers to make transfers of the Right to run said Machine, or sell to those who may be desirous to purchase the Right for one or more of the States.

This Machine is now in successful operation in ten or twelve Iron Works in and about the vicinity of Pittsburgh, also at Phoenixville, and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous:

Considerable saving in first cost; saving in power; the entire saving in shingler's, or hammerman's wages, as no attendance whatever is necessary.

It being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required.

The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal, as under the hammer.

The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery.

The bars roll sounder, and are much better finished.

The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated.

For further particulars address the subscriber at TROY, N. Y.

P. A. BURDEN.

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FOR THE SALE OF

SHEET BRASS,

COPPER AND BRASS WIRE,

BRASS AND COPPER TUBING,

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Manufactured at WATERBURY, Conn.

Railroad Spikes & Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, EXCLUSIVE TOWNER of all **Henry Burden's Patented Machinery for making Spikes**, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad Fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention. **WM. F. BURDEN, Agent,** Troy Iron and Nail Factory, Troy, N. Y.

Patent Machine-made Horse Shoes.

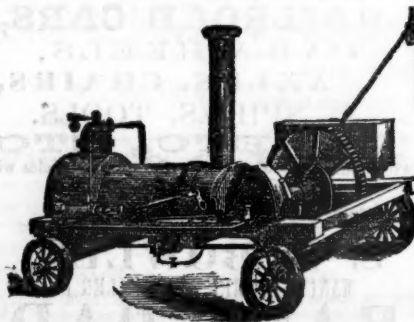


THE TROY IRON AND NAIL FACTORY have always on hand a general assortment of Horse Shoes made from **Refined American Iron**.

Four sizes being made, it will be well for those ordering to remember that the size of the Shoe increases as the numbers—No. 1 being the smallest.

WM. F. BURDEN, Agent, Troy Iron and Nail Factory, Troy, N. Y.

FIRST INTRODUCED JULY, 1849



A. L. ARCHAMBAULT,

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**PORTABLE STEAM HOISTING
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From 3 to 30 horse-power, and

STATIONARY ENGINES, from 3 to 100 horse-power

S. E. cor. Fifteenth and Hamilton Sts.,

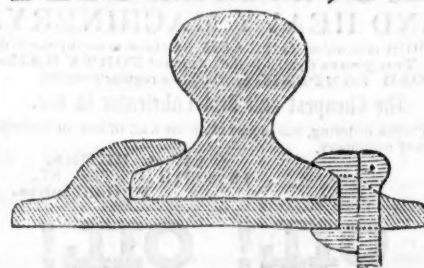
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RAILROAD SPIKE COMPANY,

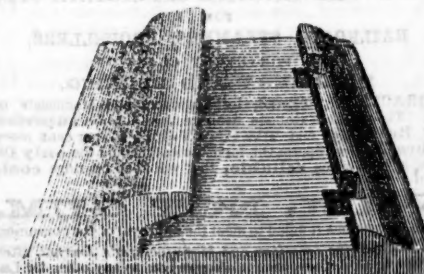
SUCCESSORS TO PORTER, ROLFE & SWETT,

MANUFACTURERS OF

**RAILROAD SPIKES
AND CHAIRS,
PITTSBURG, PA.**



HAVING built a large Rolling Mill with new and improved Machinery, we are fully prepared to execute orders at the lowest rates, for any amount of **SPIKES and CHAIRS** made of the best **JUNIATA IRON**.



Particular attention is invited to our **NEW WROUGHT IRON CHAIR**, as being the best in use.

DILWORTH & BIDWELL.